

**Ph.D. student in Genetics, Molecular and Cellular Biology, University of Pavia (Cycle 41):
“New antibacterial drugs against the ESKAPE pathogens.”**

Supervisor: Prof. Silvia Buroni

Reviewer: Giulia Barbieri

Arooba Arshad

30th March, 1997

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Introduction: *I aspire to leverage my skills to create impactful innovations that advance biology and deliver tangible outcomes for real-world benefits.*

Work Experience

- 1. Molecular Microbiology Laboratory,
Department of Biology and Biotechnologies – The University of Pavia** Pavia, Italy
Researcher (*Assegno di ricerca*) 01.05.2024 – 30.09.2025
Projects: “Study of persistence mechanisms in bacterial populations” and “Characterization of the compound PDSTP as antibiotic adjuvant against *Pseudomonas aeruginosa*”.
 - Designing and performing experiments, interpreting and analyzing results
 - Record keeping and maintenance of laboratory journal
 - Literature reviewing and contributing to scientific writing
 - Laboratory techniques:
 - PCRs for DNA and RNA amplification (RT-PCR, qPCR, Emulsion PCR), Susceptibility testing (Microbroth Dilution Method, Checkerboard assay), Recombinant protein production and bioactivity testing, Flow cytometry (FACS), Microscopy.
 - 2. National TB Control Program, National Tuberculosis Reference Laboratory** Islamabad, Pakistan
Laboratory Technician 21.05.2023 – 6.01.2024
 - Diagnosis through Xpert MTB/RIF Ultra assay for identification of *Mycobacterium tuberculosis* complex (MTBC) and Rifampicin resistance.
 - Mycobacterial culture (solid LJ media and liquid 7H9 broth).
 - Phenotypic drug susceptibility testing through BACTEC MGIT 960 system.
 - Genotypic testing on clinical specimens and cultivated samples through Line Probe Assay for identification of mutations associated with drug resistance.
 - 3. Department of Pharmacological and Biomolecular Sciences – University of Milan** Milan, Italy
Research Intern 1.10.2021–15.12.2022
Research objective was to dissect the functioning of the Lpt protein machine that transport LPS to the outer membrane in *Escherichia coli* for my master’s dissertation. Methodology based on techniques involving microbiology, molecular biology and biochemistry. Skill-set includes:
 - Escherichia coli* sampling, culturing, inoculation, plasmid construction.
 - DNA extraction, PCR, PCR-based Site-Specific mutagenesis.
 - Preparation of competent cells and transformation through electroporation and calcium chloride.
 - Genetic transduction – preparation of phage stock (P1 vir lysate) and transducing into stationary phase cultured cells.
 - Biochemistry Techniques – Western Blot, Gel Electrophoresis (Tricine-SDS PAGE & Agarose PAGE), Sucrose Density Gradient Cell Centrifugation.
 - Isolation of spontaneous Novobiocin-resistant mutants and their phenotypic characterization via microbroth dilution assay and checkerboard assay.
 - Microscopy (Phase Contrast and Fluorescence).
 - 4. Department of Pathology – Shifa International Hospital** Islamabad, Pakistan
Diagnostic Technician – Phlebotomy & Histology 06/2019 – 12/2019
Techniques for blood withdrawal and sample collection, including patient identification, venipuncture, specimen handling, and adherence to safety and quality standards.
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Education

Università degli Studi di Pavia
PhD in Genetics, Molecular and Cellular Biology

Pavia, Italy
1.10.25 – on going

The University of Pavia (UniPV)
Master's in Molecular Biology and Genetics

Pavia, Italy
12.10.2020-29.03.2023

- Master's Thesis: Characterization of suppressor mutation in *lptF* that overcomes the lack of LptC, an essential component of the lipopolysaccharide transport system in *Escherichia coli*.
- Relevant Courses: Microbial Genetics, Advanced Molecular Biology, Molecular Microbiology, Biochemistry.
- Final Degree Score: 110/110 (cum laude)

National University of Sciences and Technology (NUST)

Islamabad, Pakistan

Bachelor of Science in Applied Biosciences

14.11.2016 -15.06.2020

- Bachelor Thesis: Comparative In-silico Study of Pathogenic Candida and Edible Mushroom Lipases as Green Catalysts for Sustainable Biodiesel Production.
- Relevant Courses: Molecular biology, Microbiology and Virology, Bacteriophage Therapy, Immunology.
- Cumulative GPA: 3.58 / 4.0

Publication and Conference:

- a) Scoffone, V.C.; Trespidi, G.; Barbieri, G.; Arshad, A.; Israyilova, A.; Buroni, S. **The Evolution of Antimicrobial Resistance in *Acinetobacter baumannii* and New Strategies to Fight It.** *Antibiotics* **2025**, *14*, 85. <https://doi.org/10.3390/antibiotics14010085>
 - b) Conference: **SIMGBM - Microbiology 2025.**
Arooba Arshad, Antonio Frandi, Viola C. Scoffone, Gabriele Trespidi, Matteo Brilli, Marco Fondi, Silvia Buroni. **Ploidy-driven genomic recirculating in prokaryotes linked to bacterial persistence.**
 - c) Conference: **FEMS MICRO Milan 2025.**
Gabriele Trespidi, Arooba Arshad, Viola C. Scoffone, Samuele Irudal, Martina Caneva, Giulia Barbieri, Vadim Makarov, Maria Rosalia Pasca, Silvia Buroni. **Exploring the antibiotic adjuvant potential of a new membrane-perturbing dispirotriperazine compound against *Pseudomonas aeruginosa*.**
 - d) Conference: **INF-ACT meeting 2024, Pavia, September 11-12, 2024.**
Gabriele Trespidi, Arooba Arshad, Viola C. Scoffone, Samuele Irudal, Martina Caneva, Giulia Barbieri, Vadim Makarov, Maria Rosalia Pasca, Silvia Buroni. **Characterization of the compound PDSTP as antibiotic adjuvant against *Pseudomonas aeruginosa*.**
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- **Proficiency in Bioinformatics tools** – Genome Browsers (Ensembl, EcoCyc, NCBI), Pymol, R-studio.
 - **Proficiency in Microsoft tools** – PowerPoint, Word and Excel
 - **Soft Skills:** Leadership, debating, public speaking, presentation skills, teamwork.
 - **Languages:** First language Pashto (*mother tongue*), Urdu (*mother tongue*), English (*IELTS score: 8.5, Level: C2*), Italian (*learning through course, A1*)
 - **Online and Off-Campus Course**
Technical University of Denmark - Antimicrobial Resistance - theory and methods (2019)

Reference

- **Prof. Silvia Buroni**
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- **Prof. Alessandra Polissi**
Full Professor of Microbiology, Department of Pharmacological and Biomolecular Sciences, University of Milano, Email: alessandra.polissi@unimi.it, Phone: +39 02 503 18205.

17th July, 2025